

**REMARKS**

Claims 102-124, 126-131, and 133-139 are pending in the application with claims 102, 110, 118, 129, and 135 amended herein and claim 135 previously withdrawn.

Claim 113, 114, and 136-139, the subject matter of which was newly presented in the previous Response to June 11, 2003 Office Action, were withdrawn from consideration in the current Office Action as being directed to a non-elected invention. Page 2 of the Office Action alleges that such claims introduce specific plasma parameters not previously considered and generate new species of the claimed method. Applicant requests reconsideration and withdrawal of the restriction requirement. Applicant asserts that it is entitled to consideration of claims 113, 114, and 136-139 in the next Office Action unless the Office presents a proper restriction requirement.

The Office Action alleges that the claims 102-134 originally presented for prosecution on the merits set forth some unnamed species of the claimed method constructively elected by Applicant and that claims 113, 114, and 136-139 introduce a new species. However, the Office Action does not identify what species the Applicant allegedly previously elected nor the new species upon which claims 113, 114, and 136-139 allegedly read.

Prior to making a restriction requirement, the Office is required to identify the allegedly patentably distinct species. The Office Action does

not identify any patentably distinct species. The Office Action merely states that the blanket exposing parameters set forth in the subject claims “generate new species,” but does not identify any species from which the blanket exposing parameters are allegedly patentably distinct. It is impossible for the Office to make a species restriction when the Office Action only alleges the existence of one species. Every species restriction requires the identification of multiple patentably distinct species.

Applicant additionally asserts that “specific parameters of the plasma exposure” set forth in the subject claims does not constitute a proper species. MPEP 806.04(e) states that “*claims are never species.*” Instead, “*species are always the specifically different embodiments.*” The Office must identify specifically different embodiments and then allege (or request Applicant to choose) which claims read upon the species so identified. It is impossible to determine merely from the text of the Office Action whether the remaining claims read upon the “specific parameters of the plasma exposure” species or upon the other unnamed species.

MPEP 806.04(f) states that “claims to be restricted to different species must be mutually exclusive.” The Office has not identified which claims are readable upon the constructively elected species. It is impossible from the Office Action to determine whether claims 113, 114, and 136-139 are in fact mutually exclusive from claims readable upon the constructively elected species. Applicant asserts that claims 113, 114, and 136-139 are not mutually exclusive from claims 102-112, 115-124,

126-131, and 133-135 and, accordingly, even a properly presented restriction requirement is unlikely to result in withdrawal of claims 113, 114, and 136-139.

At least for the indicated reasons, the present restriction is deficient and Applicant requests withdrawal of same in the next Office Action. Alternatively, the Office may correct the present restriction requirement in the next Office Action or in a telephonic restriction and allow applicant to identify claims readable upon different species made apparent by the Office at such time.

Applicant acknowledges that claims 113, 114, and 136-139 set forth blanket exposing parameters not previously presented with the current set of claims. Applicant also acknowledges that, if new claims are directed to an invention distinct from and independent of the invention previously claimed, then a restriction requirement can be made pursuant to 37 C.F.R. 1.145. However, 37 C.F.R. 1.145 does not relieve the Office of its responsibility to identify the nature of the allegedly distinct and independent claims. It is impossible from the current Office Action to determine whether the Applicant in fact constructively elected a particular species and that claims 113, 114, and 136-139 read upon a species that is patentably distinct from the previously constructively elected species. Applicant asserts that, upon reconsideration, the Office will find Applicant entitled to consideration of claims 113, 114, and 136-139 without a species restriction. If such claims had been presented along with claims 102 -134

at the time they were originally entered, then the Office could not have reasonably justified a species restriction of the subject matter of current claims 113, 114, and 136-139. At least for the reasons described above, Applicant requests consideration of the restricted claims in the next Office Action.

Claims 102-112, 115-124, 126-131, 133 and 134 stand rejected under 35 U.S.C. 112, first paragraph, as lacking an enabling description in the present specification. Applicant requests reconsideration.

Page 3 of the Office Action states that claims 102 and 129 appear to require a conversion to  $(\text{CH}_3)_x\text{SiO}_y$  and a reduction of its dielectric constant to happen simultaneously or with a single plasma oxygen exposure. The Office Action then alleges that such single plasma oxygen exposure is not enabled.

Without admitting even to the propriety of the present rejection, Applicant asserts that it is entirely irrelevant with regard to the enablement of claims 102 and 129 whether or not the present specification enables conversion to  $(\text{CH}_3)_x\text{SiO}_y$  and reduction of its dielectric constant simultaneously or with a single plasma oxygen exposure. The entire subject matter of claims 102 and 129 expressly set forth in such claims is clearly supported by the present specification. Pursuant to 35 U.S.C. 112, first paragraph, the present specification properly contains a description of the invention sufficient "to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the

same.” As such, the present specification fully enables the subject matter of all pending claims.

In particular, Applicant notes that page 10, lines 12-19 and page 10, line 22 to page 11, line 5 along with page 12, lines 15-21 clearly enable the bulk of the subject matter set forth in claims 102 and 129.

Additionally, page 8, line 16 referring to page 6, line 21 to page 8, line 15, and perhaps elsewhere throughout the specification, clearly enable any remaining subject matter set forth in claims 102 and 129. The present rejection appears to be concerned with the embodiment described on page 9, line 1 to page 10, line 7. However, with regard to enablement of claims 102 and 129, it is irrelevant whether claims 102 and 129 even encompass such embodiment since claims 102 and 129 are fully enabled elsewhere throughout the specification.

A thorough review of the present specification reveals a variety of embodiments each of which may or may not be encompassed by claims 102 or 129. However, such inclusion is not determinative with regarding to findings of enablement. Applicant does not herein make any assertion whether or not one or more of the embodiments enabled by page 9, line 1 to page 10, line 7 of the present specification are encompassed by claims 102 or 129. At least for the reasons set forth herein, Applicant requests withdrawal of the lack of enablement rejection in the next Office Action.

Claims 102-112, 115-124, 126-131, 133, and 134 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Without

admitting to the propriety of such rejection, Applicant herein amends claims 102 and 129 to substitute the terms "effective to" with alternative terms. Applicant asserts that the alternative terms satisfy the requirements of the Office Action.

Claims 102-110, 112-124, 126-128, 129-131, 133, and 134 stand rejected under 35 U.S.C. 103 as being unpatentable of Yau in view of Morita. Applicant requests reconsideration.

Amended claim 102 sets forth a method for forming an insulative layer having a relatively low dielectric constant that includes, among other features, loading a substrate into a PECVD reaction chamber, chemically vapor depositing a first layer, and after depositing, blanket exposing the first layer to an oxygen containing plasma. The first layer has a first dielectric constant and contains silicon atoms bonded to carbon atoms. The depositing includes introducing a gaseous material precursor and a dry oxygen-containing gaseous material into the reaction chamber while generating a plasma in the reaction chamber. The plasma forms the low dielectric constant insulative layer from the first layer, reduces the first dielectric constant to a second dielectric constant, allows a base chemistry of the whole deposited first layer to remain substantially without transformation to another base chemistry, and does not appreciably etch the first layer. Page 5 of the Office Action alleges that Yau discloses all the limitations of claim 102 except for blanket exposing the first layer to an

oxygen containing plasma and pages 6-7 of the Office Action rely upon Morita as allegedly disclosing such limitation. Applicant traverses.

Page 6 of the Office Action acknowledges that Morita describes removing the organic functional groups of an organic silicon thin film 10 and transforming the film into a silicon oxide film 11. Applicant asserts that transformation from organic silicon thin film 10 to silicon oxide film 11 constitutes transformation from one base chemistry to another base chemistry. The text bridging pages 6-7 of the Office Action nevertheless alleges that Morita discloses an oxygen containing plasma that allows a base chemistry of the whole deposited first layer to remain substantially without transformation to another base chemistry after the blanket exposing converts the first layer to the insulative layer. The Office Action alleges that “no requisite is provided for ‘substantially’” and that the terms of claim 102 do not require such step to occur.

Applicant herein amends claim 1, as discussed above, replacing the term “effective to” with an alternative limitation satisfying the Office’s imposed interpretation of positively recited limitations. At least because amended claim 102 satisfies the Office’s view regarding positive limitations, Morita no longer can be considered to disclose every limitation set forth in claim 102. In addition, Applicant asserts that page 12, lines 5-9 define and provide meaning to the term “substantially without transformation.” Specifically, “substantially without transformation” refers to the circumstance where “an outermost portion of the exposed layer

might experience a slight rejection in carbon content, but otherwise that portion and the whole of the layer is not transformed.” At least for such additional reason, Morita fails to disclose or suggest the claim 102 limitations allegedly taught therein.

Claims 103-110, 112-124, 126-128, and 136 depend from claim 102 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested.

Amended claim 129 sets forth a method for forming an insulative layer having a low dielectric constant that includes, among other features, loading a substrate into a PECVD reaction chamber, chemically vapor depositing a first layer, and after depositing, blanket exposing the first layer to an oxygen containing plasma. The first layer has a first dielectric constant. The depositing includes introducing a gaseous material precursor and a dry oxygen-containing gaseous material into the reaction chamber while generating a plasma in the reaction chamber. The oxygen containing plasma forms the insulative layer for the first layer, reduces the first dielectric constant to a second dielectric constant for the insulative layer, and does not appreciably etch the first layer. The second dielectric constant is in a range of about 2.5 to 2.0 and the whole insulative layer contains  $(\text{CH}_3)_x\text{SiO}_y$ . Applicant asserts that the cited combination fails to disclose every limitation of amended claim 129. Page 5 of the Office Action alleges that Yau discloses every limitation of claim 129 except for blanket exposing the first layer to an oxygen containing plasma and page 6



relies upon Morita as allegedly disclosing the missing subject matter. Applicant traverses.

Page 6 of the Office Action states that claim 129 “only requires the ‘whole’ insulative layer to **comprise**  $(\text{CH}_3)_x\text{SiO}_y$  which does not require the whole layer to **be**  $(\text{CH}_3)_x\text{SiO}_y$ .” Applicant asserts that the Office’s interpretation ignores the literal meaning of the terms sets forth in claim 29. The word “whole” is defined in The American Heritage Dictionary of the English Language, Fourth Edition, published by Houghton Mifflin Company as containing all components, complete, not divided or disjointed, in one unit, constituting the full amount, etc. Applicant notes that reference to different dictionaries reveals equivalent definitions. Also, the present specification uses the term “whole” in an equivalent manner at least on page 9, line 21, page 12, lines 4 and 7, and page 15, line 2.

The Office’s position is that the term “the whole insulative layer comprises  $(\text{CH}_3)_x\text{SiO}_y$ ” is identical to the term “the insulative layer comprises  $(\text{CH}_3)_x\text{SiO}_y$ .” Such an interpretation is incorrect and does not properly give weight to the added term “whole.” The Office is reminded that the patent statutes require claims to be presented and interpreted in accordance with what the Applicant regards as its invention, not as to what the Office regards as the invention. Accordingly, the Office must read the claims as Applicant regards them (as they are worded) not as the Office might regard them.

Applicant acknowledges that claim 129 does not require the insulative layer to consist of  $(\text{CH}_3)_x\text{SiO}_y$ , where the term “consist” is interpreted as a transitional phrase different from the term “comprise.” However, the term “the whole insulative layer comprises  $(\text{CH}_3)_x\text{SiO}_y$ ” states that all components of the insulative layer, the complete insulative layer, the undivided insulative layer, and/or the full amount of the insulative layer contains  $(\text{CH}_3)_x\text{SiO}_y$ . Stated another way, the insulative layer does not have any parts that only contain a material other than  $(\text{CH}_3)_x\text{SiO}_y$ .

Thus, comparing the express terms of claims 129, Morita does not disclose or suggest the whole insulative layer comprising  $(\text{CH}_3)_x\text{SiO}_y$ . Instead, organic silicon thin film 10 is transformed by oxygen plasma to partly contain silicon oxide film 11 by removing organic functional groups. As such, Morita does not disclose or suggest an insulative layer formed from a first layer by blanket exposing the first layer to an oxygen containing plasma where the whole insulative layer contains  $(\text{CH}_3)_x\text{SiO}_y$ . A part of the Morita insulative layer contains silicon oxide with any  $(\text{CH}_3)_x\text{SiO}_y$ . At least for such reason, claim 129 is patentable over Yau in view of Morita.

Claims 130, 131, 133, 134, and 137-139 depend from claim 129 and are patentable at least for such reason as well as for the additional limitations of such claims not disclosed or suggested.

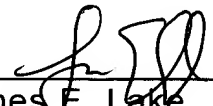
As established herein, claims 102-110, 112-124, 126-131, 133, 134, and 136-139 are patentable. Applicant requests allowance of such claims in the next Office Action.

Claim 111 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Yau in view of Morita and further in view of Miyasaka. Applicant requests reconsideration. Claim 111 depends from claim 102 the subject matter of which is described above. However, Miyasaka does not remedy the deficiencies of Yau in view of Morita as applied to claim 102. Accordingly, claim 111 is patentable at least for its dependence from claim 102 as well as for any additional limitations not disclosed or suggested. Applicant requests allowance of claim 111 in the next Office Action.

Applicant asserts herein adequate reasons in support of patentability with regard to claims 102-124, 126-131, 133, 134, and 136-139. Applicant requests allowance of all such pending claims in the next Office Action.

Respectfully submitted,

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